Cleaning & Sanitising – Food processing industry

Replacing synthetic cleaners & sanitisers
by natural alternatives

Introduction

- New challenges facing the **food industry** include:
  - new food production
  - preparation and distribution techniques
  - changing eating habits
  - increasing volumes of food being produced and transported around the world
- Furthermore, opportunities for **international trade** are enhanced where food is produced in a strictly hygienic environment, and a country that follows strict hygienic practices gains a reputation as a producer of safe food
- **GMP, HACCP, effective cleaning and sanitising** of the facilities and the equipment as well as personnel hygiene are essential to ensure the safety and suitability of food for consumption

GMP: Good Manufacturing Practice: quality controls
HACCP: Hazard Analysis and Critical Control Points: preventive quality programs

Conventional Cleaning & Sanitising

SURFACES

- The are different steps to follow when cleaning & sanitising **surfaces** in the food processing industry
  - Pre-wash
  - Alkaline cleaning (remove organic matters) / First rinse
  - Acid phase cleaning (remove mineral matters) / Second rinse
  - Disinfection / Final rinse
- Not all steps are always used and/or can be **combined** to save time and energy
- The procedures for cleaning and sanitising are different depending on whether the equipment is cleaned out of place (**COP**), e.g. hand-cleaned, or cleaned in place (**CIP**)
- **Disinfection phase**: it is important to know:
  - which micro-organisms are of concerned as the bacteria (gram+ or gram-), spores, yeasts, fungi and viruses react differently to disinfectants
  - pH and temperature of the environment to sanitise

CIP (Clean-in-Place) is a method of cleaning the interior surfaces of pipes, vessels, process equipment, and associated fittings, without disassembly

Conventional Cleaning & Sanitising

AMBIENT AIR

- Micro-organisms are carried by dust in the air. This can cause contamination of surfaces and foodstuffs
- Ventilation systems should be designed and constructed so that air does not flow from contaminated areas to clean areas and, where necessary, they can be adequately maintained and cleaned

PERSONNEL HYGIENE

- All persons should **wash and sanitise their hands** upon entering food handling areas, before starting work, after handling contaminated materials, after break and after using toilet facilities to minimise microbiological contamination.
- Garments like **gloves and boots** should be disinfected at intervals throughout the day

Conventional Cleaners & Sanitisers

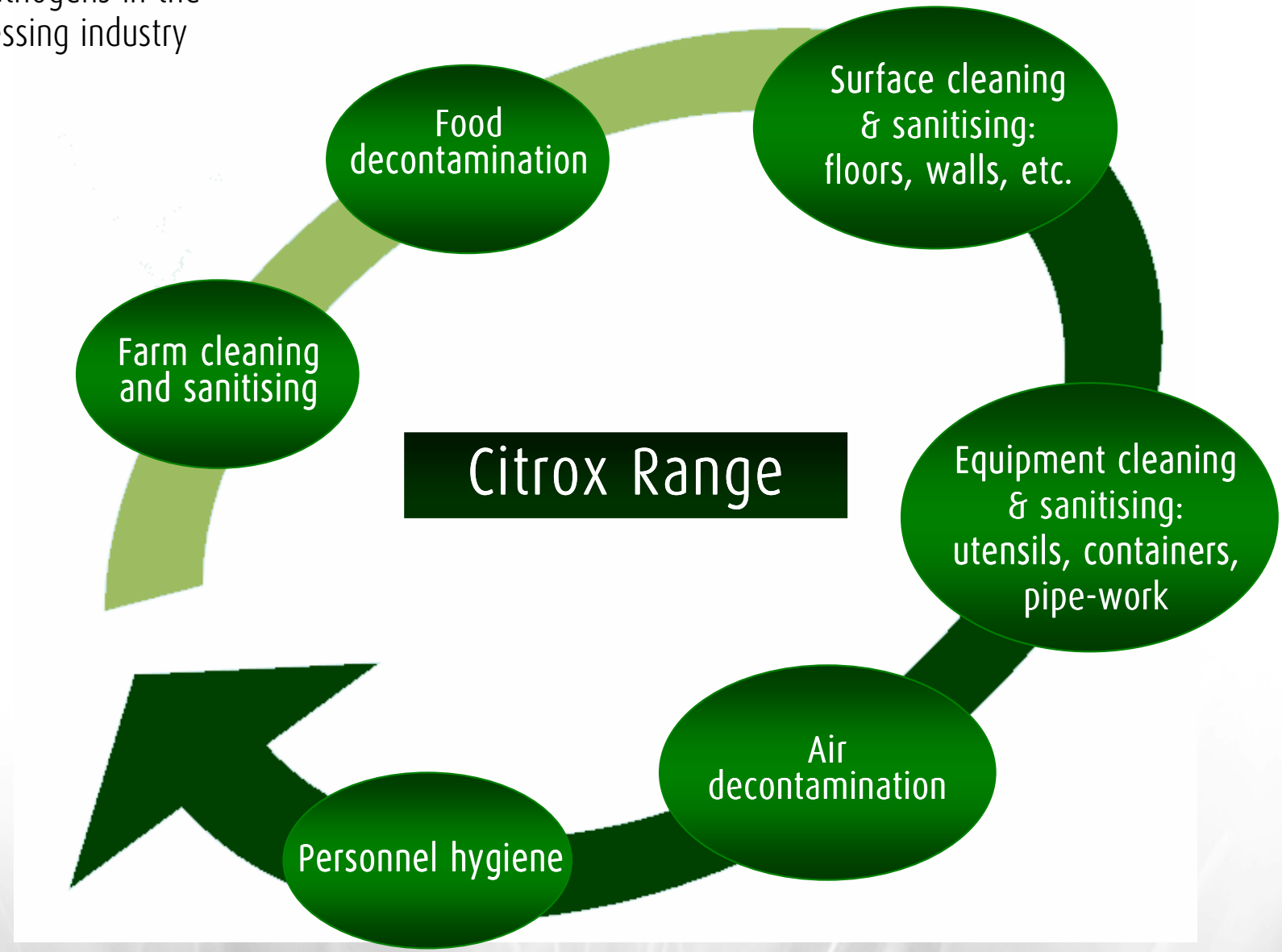
- For many years **chlorine** and **caustic soda** have been the standard, cheap chemicals used to clean and decontaminate food processing facilities, and to reduce the risk of infections. It is now known and generally acknowledged, that these products are **corrosive** and a **health hazard**, and a proven cause of severe health problems
- The use of chlorine has already been **banned** in organic food processing, and this ban will extend to all foodstuffs in due course. Further it is inevitable that caustic soda will be subject to similar pressure
- Without exception, chlorine and all currently available synthetic disinfectants are unsuitable for use in the disinfection of food during preparation, and in food preparation areas because of **high toxicity levels**

Citrox hygiene range

- The **Citrox** hygiene range includes novel products that address the growing demands for **replacing potentially harmful, synthetically** based products for use in cleaning and sanitising operations in the **food processing** industry
- **Citrox** technology incorporates a truly **holistic approach** designed to increase the effectiveness and **efficiency** of cleaning & sanitising operations using **non-toxic and non-corrosive** formulations, some of which even carry **organic status**.
- The various products are effective over a **wide range of pathogens**, including gram positive and gram negative bacteria, viruses, moulds, yeasts and fungi.

Citrox
Innovative solutions from nature.

Figure 1: A holistic approach to the control of harmful pathogens in the food processing industry



Citrox main applications

SURFACES

- ProSino™ natural cleaners and sanitisers can be used safely (by dipping, spraying, fogging or manual methods) wherever efficient surface hygiene and cleaning is required in **food processing** facilities.
  - Not in contact with foodstuffs: these surfaces must be cleaned and sanitised to avoid cross-contamination with foodstuffs:
    - Floors, walls, ceilings
    - Transport vehicles
    - Shipping containers
    - Cool rooms, dump tanks
    - Waste bins, fabrics, drapes
    - Kitchen, bathrooms, toilets
  - In contact with foodstuffs:
    - Bench tops and cutting boards
    - Tools, utensils and automated equipment
    - Filters and tanks
    - Tray and bottle

Citrox main applications

AMBIENT AIR

- ProSino™ organic and non-toxic sanitisers can be used safely (by fogging methods) to fog the environment and minimise cross-contamination
- ProSino™ cleaners and sanitisers can also be used to remove contamination and biofilms present in ventilation devices

PERSONNEL HYGIENE

- ProCaro™ Hand sanitisers are 100% natural, alcohol free and very effective against a wide range of bacteria, fungi and viruses. They are ideally suited for daily repeated use in the food industry

Benefits – ProSino™ range

- Effective against a wide range of bacteria and fungi
- Non-toxic, naturally derived ingredients
- Non-corrosive
- Hypo-allergenic
- Strong residual effect
- Breaks down biofilm
- Effective in the presence of organic matter
- Non-tainting
- Safe to use on all surfaces and fabrics
- No fragrance or dye added
- Stored easily

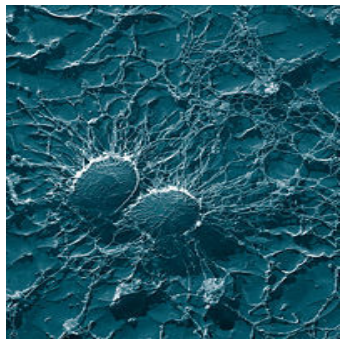
Pathogens tested to date

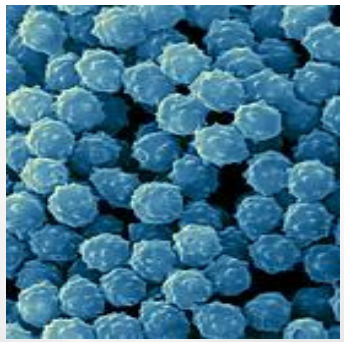
Bacteria

- Campylobacter jejuni
- Dipiodia natalensis
- Escherichia coli
- Geotrichum candidium
- Klebsiella pneumoniae
- Lactobacillus pentoaceticus
- Legionella pneumophila (NCTC 11192)
- Listeria monocytogenes
- MRSA (clinical strain)
- Mycobacterium fortutium (NCTC 8573)
- Proteus vulgaris
- Pseudomonas aeruginosa (ATCC 15442)
- Salmonella cholerasuis
- Salmonella typhimurium (DT004)
- Staphylococcus aureus (NCTC 6571)
- Staphylococcus pyogenes
- Staphylococcus sp.
- Streptococcus faecalis

Yeast and Fungi

- Aspergillus flavus
- Aspergillus niger
- Aspergillus terreus
- Botrytis cinerea
- Candida albicans
- Candida glabrata
- Chaetonium globosum
- Cladosporium
- Collectotricum sp.
- Fusarium sp.
- Geotrichum candidium
- Mucor sp
- Penicillium sp.
- Penicillium digitatum
- Penicillium funiculosum
- Penicillium italicum
- Penicillium roqueforti
- Phomopsis ortl
- Pullularia pullulans
- Pythium sp.
- Trichophyton interdigitale
- Trichophyton mentagrophytes





All of the pathogens/viruses are tested at independent laboratories.
Certificates & reports available on request.

Pathogens tested to date

Viruses

Human Rhinovirus - Retroscreen Virology

Influenza A - Retroscreen Virology

Human Immunodeficiency Virus (HIV) - Retroscreen Virology

Urbani SARS - Retroscreen Virology

African swine fever

Avian influenza

Foot & mouth disease

Gumboro virus

Herpes virus type 1 & type 2

Herpes zoster

Hepatitis A & B

Newcastle disease

Severe Acute Respiratory Syndrome (SARS)

Protozoa

Histomonas meleagradis

Giardia lamblia

Entamoeaba histolytica

Blastocystis hominis

All of the pathogens/viruses are tested at independent laboratories.
Certificates & reports available on request.

Direction for use

Work surfaces, storage area, ventilation systems

Floors, walls, cool rooms, ventilation systems

- **Hose down** surface with clean water to remove slime, food residue and debris between processes
- **Clean** with **ProSino™ Foaming Cleaner (14XP)** at required dilutions, depending upon the degree of soiling, nature of the surface to be cleaned and hardness of water (2 to 5%)
- Leave for 15-20 minutes then rinse off thoroughly
- Sanitise with a 0.5% solution of **ProSino™ Sanitiser (14WPS2)** to create a protective ongoing effect (1% / 5% if spraying / fogging)

Locker rooms, toilets and showers

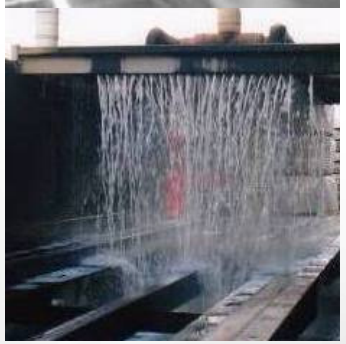
- Sanitise with a solution of 0.5% **ProSino™ Sanitiser** (1% / 5% if spraying / fogging)

Waste Receptacles

- Containers for scraps, etc. should be rinsed and cleaned with **ProSino™ Foaming Cleaner (14XP)** at 2 to 5% to prevent malicious odours and possible cross contamination by flies and other vector insects. After being emptied and cleaned the containers should be sanitised with **ProSino™ Sanitiser**.
- **ProSino™ Waste Sanitiser** should be used to control germs and odours in waste bins, sink and waste outlets

Direction for use
Containers, vehicles, utensils

- Cleaning and disinfecting of **containers, trays** and **transportation vehicles** used for the storage / transport of food or other products should be carried out immediately after unloading
- The technique of application is to work from the back to the front of the **container**
- Deposits should be removed with **ProSino™ Foaming Cleaner (14XP)** with a dilution strength depending upon the degree of soiling and nature of surface to be cleaned (2 to 5%).
- Leave for 15-20 minutes then rinse off thoroughly and then sanitise with a solution of 0.5% **ProSino™ Sanitiser** (spray/fog at 1% / 5%) to minimise the risk of cross contamination during the transport of products
- A similar procedure should be applied to **tools** and **utensils** including knives, steels and scabbards, splitting saws and cutting blocks



Direction for use
Personnel decontamination

- Aprons, Gloves and Boots
  - The above garments should be treated at intervals throughout the day with **ProSino™ Sanitiser** (at 1%)
- Hand Sanitisers
  - A dispenser of **ProCaro™** hand soap and hand sanitiser should be placed next to wash basins to allow the operators to clean and sanitise hands thoroughly

Applications: pipe lines and bulk tanks

COMMON PROBLEMS/CONTAMINATION'S IN PIPE LINES AND TANKS

- **Fats** — White greasy film water droplets clinging to walls of pipelines due to low temperature (i.e. below fat pour point).
- **Protein** — Bluish coloured film in pipeline or tanks (food tankers, storage vessels etc.)
- **Calcium and Magnesium** — Greyish white film on tanker wall or in pipeline due to high water hardness.
- **Milkstone** — White or yellow residue in pipeline due to minerals in the water reacting with proteins from the milk.
- **Iron** — Reddish brown to dark brown residues in pipeline due to excess iron in water supply.
- **Black** — Black smudges or streaks in pipelines usually due to decomposition of rubber components.

High levels of iron in the water may be removed by special water conditioning before addition of chlorine products

Applications: pipelines and bulk tanks

ProSino™ Non-foaming Cleaner (14TP) can be used to replace harsh caustic and acid cleaners currently used in cleaning pipelines and bulk tanks. It accelerates the dissolution of fats, proteins, oil fibres and milkstone that adhere to the surfaces of pipelines, tanks and vessels

RINSE CYCLE

The first rinse cycle should have **water temperature of 45-50°C**, and be run as programmed

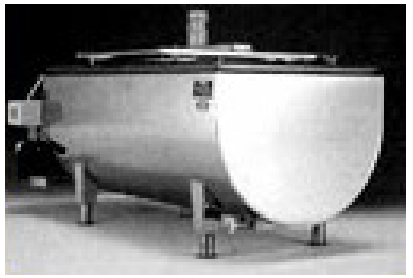
WASH CYCLE

Use water temperature of 45-50°C as the starting point; allow the system to operate as programmed. Add **ProSino™ Non-foaming Cleaner (14TP)** to the wash cycle at a rate of **2-10%** depending on degree of soiling

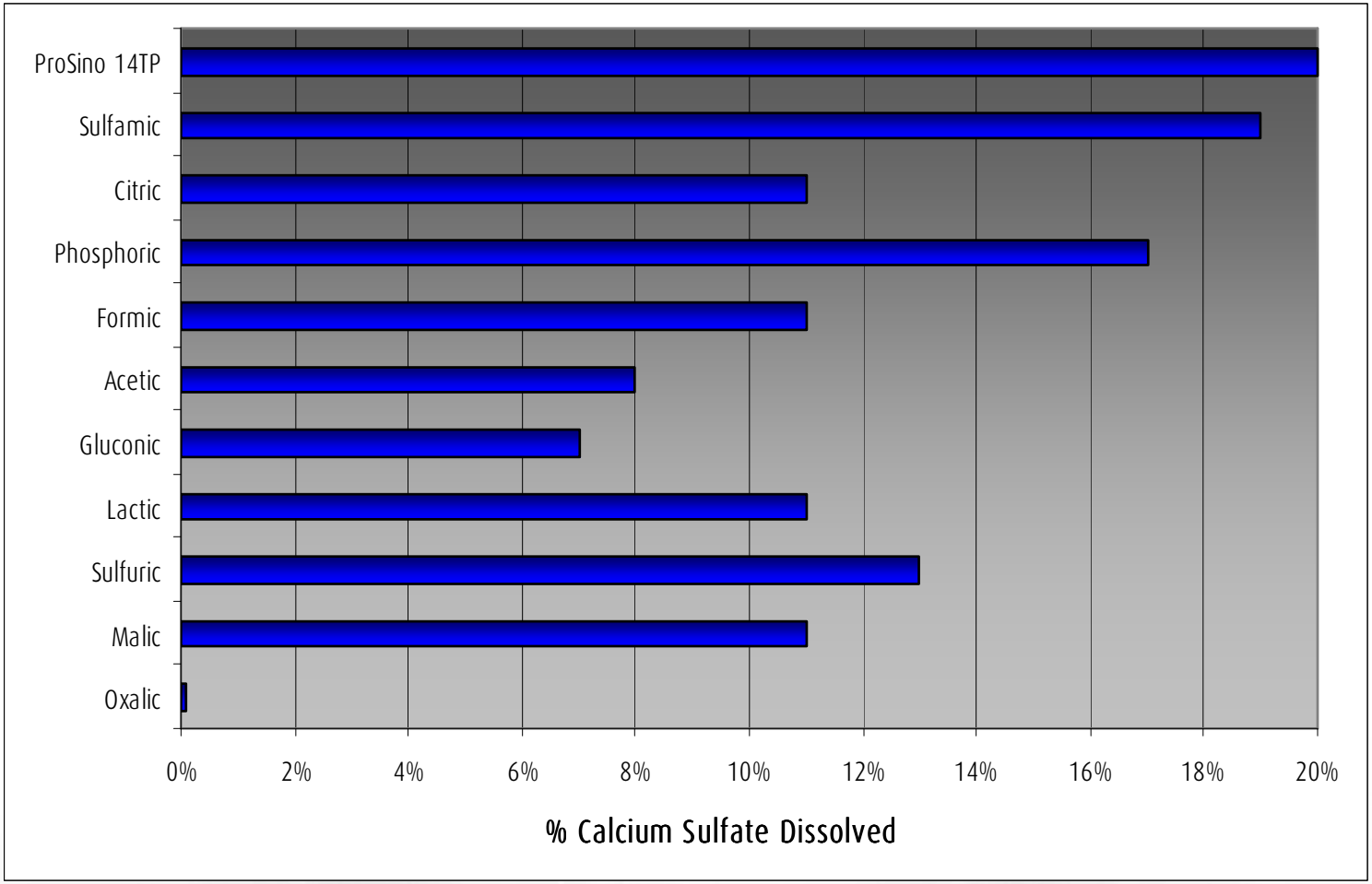
FINAL RINSE

Non food tankers / lines - Flush with clean water containing 0.1% 14TP to ensure no water salts re-precipitate after evaporation

Food tankers / lines - Chlorine containing sanitisers are usually used in this cycle but we recommend replacing the chlorine sanitising stage with **ProSino™ Sanitiser (14WPS2)** (terminal rinse sanitiser) product at 0.5% dilution



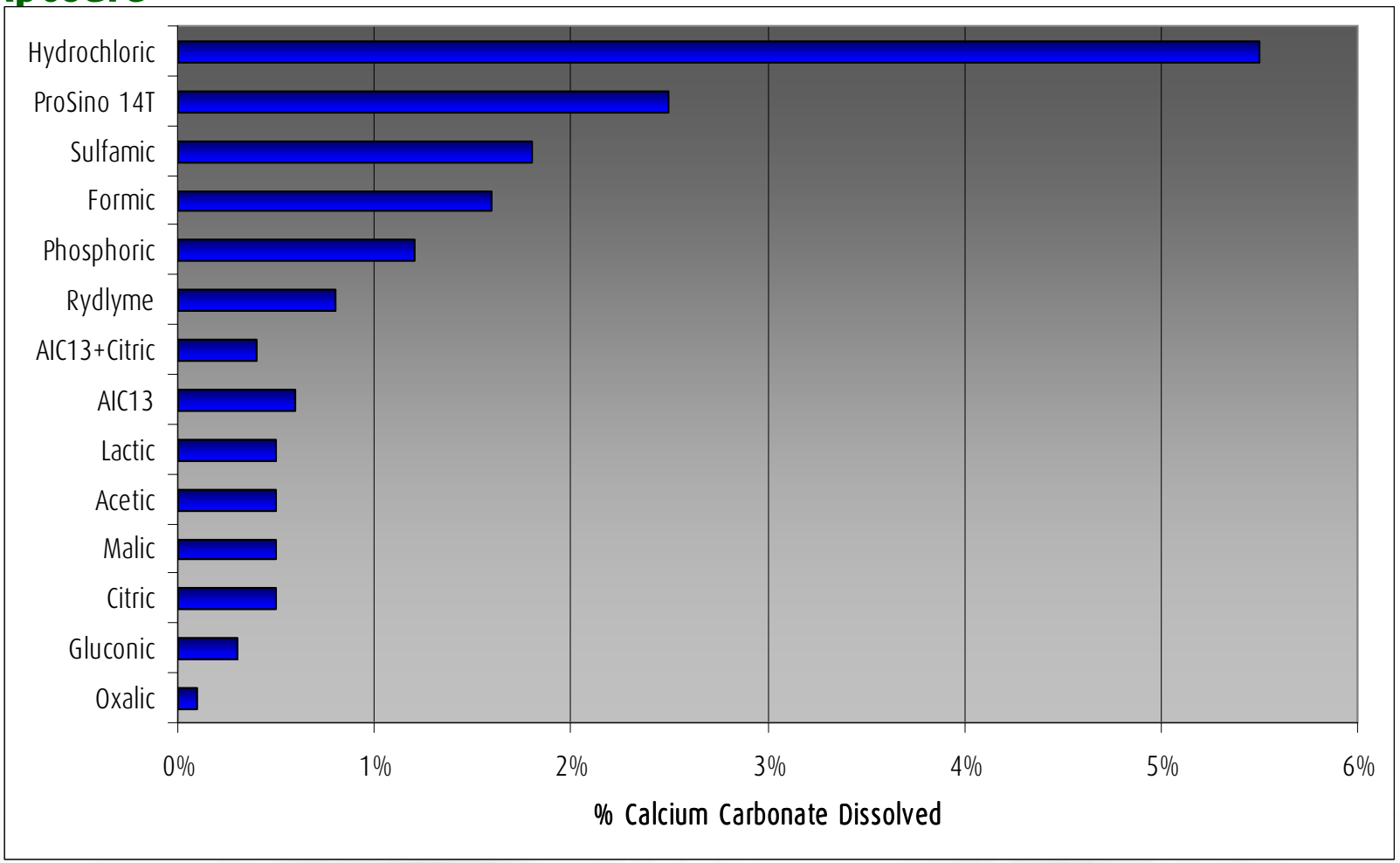
Calcium sulfate dissolving properties of acids and ProSino™ Non-foaming Cleaner (14TP) – 15min exposure



Test Conditions:

- 200 grams of 5% Solution; 1 gram of reagent grade Calcium Sulphate powder
- Add calcium Sulfate and mix for one minute
- Vacuum filter after one minute and record the weight of the undissolved Calcium Sulfate
- Calculate and record the percentage of Calcium Sulfate that has been dissolved

Calcium carbonate dissolving properties of acids and ProSino™ Non-foaming Cleaner (14TP) – 15min exposure



Test Conditions:

- 200 grams of 5% Solution; 1 gram of reagent grade Calcium Carbonate powder
- Add Calcium Carbonate and mix for one minute
- Vacuum filter after one minute and record the weight of the undissolved Calcium Carbonate
- Calculate and record the percentage of Calcium Carbonate that has been dissolved

Key Citrox products

PRODUCT	DESCRIPTION	USE
ProSino™ Non-foaming Cleaner (14TP)	Heavy-duty non-toxic, non-corrosive, **non-foaming** multi-purpose cleaner.	To be used at **2% to 10%** dilution (depending on degree of soiling) on surfaces, in C.I.P. systems and agitator machines.
ProSino™ Foaming Cleaner (14XP)	Heavy-duty non-toxic, non-corrosive, **foaming** multi-purpose cleaner with excellent oil/soil detergency properties.	To be used at **2% to 5%** dilution (depending on degree of soiling) for the cleaning of installations and equipment.
ProSino™ Surface sanitiser (14WPS2)	All-purpose non-toxic, natural surface **sanitiser**.	- To be used at ca. **0.5%** dilution to sanitise installations, equipment and utensils, at ca. **1%/5%** for spraying /fogging of rooms.
ProSino™ Waste powder (WSP)	Non-toxic biodegradable powder for the control of germs and odours in waste bins, sink and waste outlets.	- use 1 x 20g dose to control odour and germs produced by up to 25 litres of waste
ProSino™ Wet wipes (MDWP)	All-purpose non-toxic, natural, alcohol free cleaning and sanitising **wet wipes**.	- To be used to clean and sanitise work tops, stainless steel equipment, storage cabinets, food processing machinery, etc.
ProCaro™ Hand Sanitiser (STP02)	**Hand sanitising foam**. 100% natural, alcohol free, hypoallergenic. Long lasting residual effect.	Use neat via dispensing equipment. Install in wash rooms, lobbies,... Do NOT rinse off.

"Nothing in the world is as powerful as an idea who's time has come."

Victor Hugo

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